Journal of Ethnopharmacology 153 (2014) 220–232

Contents lists available at ScienceDirect

Journal of Ethnopharmacology

journal homepage: www.elsevier.com/locate/jep

Research paper

Ethnobotanical survey of medicinal plants used in the management of skin disorders among the Xhosa communities of the Amathole District, Eastern Cape, South Africa

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ARTICLE INFO

Article history:
Received 28 November 2013
Received in revised form
11 February 2014
Accepted 11 February 2014
Available online 28 February 2014

Keywords:
Ethnobotanical survey
Medicinal plants
Skin disorders
Xhosa
Eastern Cape

ABSTRACT

Ethnopharmacological relevance: Skin diseases have been of major concern recently due to the association of skin opportunistic infections and HIV/AIDS, are usually the first sign of HIV infection and conversion to AIDS. More than 90% of HIV-infected individuals develop skin and mucosal complications at some stage during the disease. Although classical medicine is undoubtedly addressing these diseases, the people of the Eastern Cape, South Africa still depend, to a large extent on traditional herbal medicine for the treatment of various diseases. The current study was undertaken to investigate the local peoples characterisation of skin diseases/disorders and to document the medicinal plants used for various skin disorders among the Xhosa-speaking communities of the Amathole District, Eastern Cape.

Materials and methods: Information was obtained by interviewing 54 respondents in 7 locations. Collection of the reported medicinal plants from the wild was assisted by the informants and identification of the collected plants specimens was done with the help of floristic works of South Africa. Quantitative methods including the use-value and the informant consensus factor (ICF) were computed for determining the relative importance of species known locally and the homogeneity of the informants' knowledge respectively.

Results: Twenty five skin disorders, classified under 5 categories are being treated with the listed medicinal plants in the study area. The highest ICF (0.45) was linked to *bacteria-related skin disorders*. This category comprised of 57 use citations, 3 skin disorders; with sore throat being the most frequently mentioned (4.2%). In this study, 106 plant species distributed in 61 families and 107 genera were identified as being used to treat one or more of the skin disorders. The species with the highest use-value was *Aloe ferox* Mill. (Xanthorrhoeaceae) known locally as *Umhlaba*. The most representative families were Solanaceae and Asteraceae with 6 species each, followed by Fabaceae, Poaceae and Rutaceae (5 species each). The leaves were the most frequently used plant part, followed by the bark (10%) and fruits (7%). Administration of the different plant parts was mostly topical (77%) on the affected area.

Conclusion: A total of twenty five skin disorders/conditions, classified under 5 categories are being treated with the listed medicinal plants in the study area. 106 plant species distributed in 61 families and 107 genera were identified as being used to treat one or more of the skin disorders. The species with the highest use-value was *Aloe ferox* Mill. (Xanthorrhoeaceae) known locally as *Umhlaba*. The most representative families were Solanaceae, Asteraceae, Fabaceae, Poaceae, Rutaceae and Euphorbiaceae. Majority of the plant species were herbs and the leaves were the most frequently used, mostly applied topically as a paste, powder or sap on the affected skin area.

1. Introduction

The skin is the largest organ by area in the body. It serves many important functions, including protection, percutaneous absorption, temperature regulation, fluid maintenance, sensory and disease control (Abbasi et al., 2010). The etiology of skin disorders clearly shows the close association that exists between an individual's health and his natural and sociocultural environment (Martínez and Barboza, 2010).

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http://dx.doi.org/10.1016/j.jep.2014.02.023
0378-8741

For example, household overcrowding, hot and humid climatic conditions may exacerbate or play an enormous part in the spread of skin infections. These factors are particularly problematic in Sub-Saharan Africa where it was found that over 78 million people were infected with Tinea capitis (a superficial fungal skin infection affecting the scalp) (De Wet et al., 2013). In South Africa, over 19 500 fire-related deaths are reported annually and they rank among the 15 leading causes of death in children and young adults between the age of 5–29 years (World Health Organization, 2002).

Although mortality rates for skin diseases are relatively low (Njoronge and Bussmann, 2007), skin ailments present a major health concern in both developed and less-developed countries because of the following reasons: skin ailments occur worldwide and amount to approximately 34% of all occupational diseases encountered (Spiewak, 2000; Abbasi et al., 2010); skin complaints affects all ages from the neonate to the elderly (Abbasi et al., 2010; De Wet et al., 2013); due to their highly visible symptoms, they impact significantly on the quality of life, are often persistent and difficult to treat. Skin diseases have been of major concern recently due to the association of skin opportunistic infections and HIV/AIDS. Skin manifestations are usually the first sign of HIV infection and conversion to AIDS and more than 90% of HIV-infected individuals develop skin and mucosal complications at some stage during the disease (Njoronge and Bussmann, 2007). With an HIV prevalence rate of 16.6% amongst South Africans aged between 15 and 49 years,

South Africa has the largest HIV epidemic in the world (Statistics South Africa, 2011). South Africa suffers from a scarcity of dermatologists, compounded by the fact that most dermatologists are centered near urban areas and are not accessible to 70% of the rural population (Caruthers, 2013). The majority of specialist care, including dermatology, is only available in the major hospitals. There are currently 167 members in the Dermatology Society of South Africa (110 of whom are exclusively in the private sector) serving a population of about 50 million (Caruthers, 2013). Many health care centers in the Eastern Cape are often run by clinical officers or nurses, rather than physicians, who act as the primary care workers but have very limited training in diagnosing dermatologic conditions (Hay and Marks, 2004). Hence, skin diseases such as dermatitis, prurigo, scabies, and papular urticaria are either untreated or over-treated with strong topical steroids or antibiotics which have been found to cause considerable disability (Njoronge and Bussmann, 2007). Additionally, in recent years, public pressure to reduce the use of synthetic antimicrobials has increased, partly due to concerns about the environmental impact and the potential health risk related to the use of these compounds (Abad et al., 2007). These short-comings, including the appearance of drug-resistant microbial strains have resulted in increased efforts for the search for better antimicrobial agents and much attention is now being directed towards natural products (Abbasi et al., 2010).

The Eastern Cape is one of the poorest regions of South Africa and it is particularly known for its richness in plant species (Phillipson, 1987). The Xhosas are the major inhabitants of this province and they live primarily in the areas called Ciskei and Transkei. They are divided into a number of subgroups with their own distinct but related heritages. One of these subgroups is called Xhosa as well. The other main subgroups are the Bhaca, Bomvana, Mfengu, Mpondo, Mpondomise, Xesibe and Thembu. The indigenous people of this province have a long history of traditional plant usage for the treatment of various diseases and ailments including the uses of plants for the treatment of wounds (Grierson and Afolayan, 1999). For many years, the Xhosas had no interaction with the Western world and they relied mainly on the traditional knowledge they had of medicinal plants to meet their requirements (Bhat, 2013). The daily activities of the Xhosa people are centered mainly on agriculture. Xhosa agriculture consists of two main sectors: cattle rearing and the production of crops and vegetables in small fields along the rivers and in home gardens. Traditionally, the Xhosas are known as cattle herders, although smaller stocks such as goats and sheep are also reared. The primary focus of their farming system is the rearing of cattle for the production of milk. In addition to agriculture the gathering of wild fruits and other edible plant parts, the collection of honey and the hunting of wildlife also contribute to their livelihood.

In spite of modern civilisation and access to modern medicine, the Xhosas still believe in the efficacy of herbal medicines, hence, the practice of traditional treatment still continues. Previous ethnobotanical surveys on Xhosa medicinal plants recorded 32 plants species used to treat opportunistic fungal infections (Otang et al., 2012), 27 plants used to treat eye, nose and throat infections (Dyubeni and Buwa, 2012), 38 plants used to treat wounds (Grierson and Afolayan, 1999) and 6 plants used in traditional Xhosa cosmetics (Dold, 2005). Another survey by Bhat and Jacobs (1995) recorded the medicinal uses of 26 Xhosa medicinal plants while Bhat (2013) recorded the medicinal and other uses of 35 Xhosa medicinal plants. Together, these studies show the extensive use that the Xhosa people make of their natural resources and show that their vast natural pharmacopoeia is one of the features that greatly enriches their culture, which has attracted the attention of pharmacologists, anthropologists and scientists (Hutchings, 1989). Although different workers have documented medicinal plants from various regions of South Africa, to our knowledge no systematic investigation on the ethnopharmacological application of medicinal plants used to treat skin diseases/disorders has been carried out among the Xhosa communities of the Amathole District, Eastern Cape. Hence, the current study was undertaken to investigate the local peoples characterisation of skin diseases/disorders and to document the medicinal plants used for the treatment of various skin conditions, in order to facilitate future scientific validation through phytochemical, antimicrobial and pharmacological studies.

In addition to the use of interviews and discussions, other analytical were used to facilitate the quantification and cross-verification of the ethnobotanical data. The quantification of ethnobotanical data allows the local significance of a given plant species to be estimated on the basis of various numerical indices (Cotton, 1996). For example the use-value of a species, estimates the overall usefulness of a given plant while the informant consensus factor estimates the use variability of the medicinal plants (Heinrich et al., 1998).

2. Materials and methods

2.1. Description of the study area

This study was carried out in the Amatole District (Fig. 1) of the Eastern Cape Province, South Africa. The Eastern Cape Province is one of the 9 provinces of South Africa and it falls within the latitudes 30°00′ to 34°15′S and longitudes 22°45′ to 30°15′E (Grierson and Afolayan, 1999). It is bounded by the sea in the East and the drier Karroo (semi-desert vegetation) in the west. The elevation ranges from sea-level to approximately 2200 m in the North of the province.

The Amathole District Municipality is situated within the Eastern Cape Province, between Port Alfred and Port St John, and includes the city of East London. The district stretches from the Indian Ocean coastline in the South to the Amathole Mountains in the North. The District includes the large parts of the former Ciskei and Transkei homeland areas, and it covers a land area of roughly 23 577.11 km² with a total population estimated at 1.7 million,